

## WHAT IS CLAIMED IS:

1. A recording position adjusting pattern forming method for adjusting a recording position of plural printing heads, each head having a different color, for recording a color image on a recording medium, the method comprising:
  - 5 assigning a first recording head of the plural recording heads as a reference recording head;
  - recording plural reference parallel bars on the recording medium with the reference recording head;
  - recording plural parallel bars on the recording medium with a second recording head of the plural recording heads, the plural parallel bars overlapping the plural reference parallel bars to form a recording position adjusting pattern.
- 10 2. The method of claim 1 comprising adjusting an inclination of the reference parallel bars which is due to inclination of the reference recording head.
3. The method of claim 1 wherein the plural parallel bars have different inclinations respectively.
4. The method of claim 1 wherein the plural reference parallel bars comprise a first set of plural reference pattern blocks and the plural parallel bars comprise a second set of plural pattern blocks.
5. The method of claim 4 wherein the plural parallel bars have different inclinations between blocks of the second set of plural pattern blocks.
6. The method of claim 1 wherein the reference recording head is a black recording head for recording a black image.

7. The method of claim 1 comprising:  
adjusting an inclination of the reference parallel bars which is  
due to inclination of the reference recording head;  
adjusting a recording position in a scanning direction of a  
5 recording head between the respective recording heads of the plural  
recording heads; and  
subsequently adjusting a recording position due to inclination  
caused between the plural recording heads by use of the recording  
position adjusting pattern.

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8. An image recording apparatus comprising:  
plural recording heads for recording images of different colors  
respectively on a recording medium,  
a recording control unit that controls a reference recording  
5 head having a reference color of the plural recording heads to record  
plural reference parallel bars on the recording medium, and controls a  
recording head other than the reference recording head to record  
plural parallel bars on the recording medium between the reference  
parallel bars with overlapping to thereby record a recording position  
10 adjusting pattern on the recording medium,  
an optical detection unit that optically detects the recording  
position adjusting pattern recorded by means of the recording control  
unit, and  
a recording timing adjusting unit that adjusts a recording  
15 timing of the plural recording heads of the recording control unit  
based on a detected output of the optical detection unit.

9. The image recording apparatus according to claim 8,  
wherein the reference recording head is a black recording head for  
recording a black image.

10. The image recording apparatus according to claim 8,  
wherein the optical detection unit detects the recording position  
adjusting pattern on a downstream side of a recording direction in a  
direction that intersects with a scanning direction of the plural  
5 recording heads.

11. The image recording apparatus according to claim 8,  
wherein the image recording apparatus is provided with an operation  
starting instruction unit and an automatic execution control unit that  
automatically operates the recording control unit, the optical detection  
5 unit, and a recording timing adjusting unit based on an operation  
starting instruction supplied from the operation starting instruction  
unit.

12. A recording position adjusting pattern forming method  
comprising:

recording plural reference parallel bars on a recording medium  
by use of a first recording head of a color that is predetermined  
5 previously among independent recording heads of plural colors that  
are used to record a color image on the recording medium, and  
recording plural parallel bars with different inclination  
respectively between adjacent bars of the reference parallel bars by use  
of a second recording head of the independent recording heads.

13. A detection method for detecting a recording position adjusting pattern comprising:

recording plural reference parallel bars on a recording medium by use of a first recording head of a color that is predetermined

5 previously among independent recording heads of plural colors that are used to record a color image on the recording medium,

recording plural parallel bars with different inclination respectively between adjacent bars of the reference parallel bars by use of a second recording of the independent recording heads, and

10 detecting the recorded parallel bars optically.

14. The detection method according to claim 13, wherein the optical detection involves detection of a reflected density of the parallel bars.

15. An alignment method for aligning plural recording heads comprising:

recording plural reference parallel bars on a recording medium by use of a first recording head of a color that is predetermined

5 previously among independent recording heads of plural colors that are used to record a color image on the recording medium,

recording plural parallel bars with different inclination respectively between adjacent bars of the reference parallel bars by use of a second recording head of the independent recording heads,

10 detecting the recorded parallel bars optically, and

adjusting a recording timing of the recording head based on the detection result.

16. The alignment method according to claim 15, wherein the recording of the reference parallel bars, the recording of the plural parallel bars with different inclination, the optical detection, and the recording timing adjustment are executed automatically.

17. An image recording apparatus provided with an auto-alignment mode for automatically executing an operation comprising:

5 independent recording heads of plural colors that are used to record a color image on a recording medium, the independent recording heads including,

10 a first recording head of a color that is predetermined previously among the independent recording heads, whereby plural reference parallel bars are recorded on a recording medium by use of the first recording head, and

15 a second recording head, whereby plural parallel bars with different inclination respectively are recorded between adjacent bars of the reference parallel bars by use of the second recording head, and

an optical device for detecting the recorded parallel bars optically, whereby a recording timing of the second recording head is adjusted based on a detection output signal from the optical device.

18. The alignment method according to claim 15 comprising:

adjusting a recording position between the plural recording heads in the horizontal direction and vertical direction with respect to a  
5 carriage moving direction, and

adjusting a recording position concomitant with reciprocation printing of carriage movement.